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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/816,933	04/05/2004	Anna H. Dyson	047182-0128	3078
22428	7590	11/09/2005	EXAMINER	
FOLEY AND LARDNER LLP SUITE 500 3000 K STREET NW WASHINGTON, DC 20007				HARRINGTON, ALICIA M
		ART UNIT		PAPER NUMBER
		2873		

DATE MAILED: 11/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

PBM

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/816,933	DYSON ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Alicia M. Harrington	2873	

- The MAILING DATE of this communication appears on the cover sheet with the correspondence address -  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### **Status**

- 1) Responsive to communication(s) filed on 26 October 2005.
- 2a) This action is FINAL.                                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### **Disposition of Claims**

- 4) Claim(s) 3-20,49-56 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 3-20,49-56 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### **Application Papers**

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 08 June 2005 is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### **Priority under 35 U.S.C. § 119**

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All    b) Some \* c) None of:
  1. Certified copies of the priority documents have been received.
  2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### **Attachment(s)**

<ol style="list-style-type: none"> <li>1)<input checked="" type="checkbox"/> Notice of References Cited (PTO-892)</li> <li>2)<input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)</li> <li>3)<input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.</li> </ol>	<ol style="list-style-type: none"> <li>4)<input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.</li> <li>5)<input type="checkbox"/> Notice of Informal Patent Application (PTO-152)</li> <li>6)<input type="checkbox"/> Other: _____.</li> </ol>
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**DETAILED ACTION**

***Response to Arguments***

1. Applicant's arguments, see page 8, filed 10/26/05, with respect to the rejection(s) of claim(s) 3-20,49-56 under Barone in view of Gothala have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Barone in view of Charlton (US 4,326,012).

***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claim 3 is rejected under 35 U.S.C. 102(b) as being anticipated by Charlton (US 4,326,012).

Regarding claim 3, Charlton disclose a kit for forming a solar module, comprising a Fresnel lens (19); and first means (building blocks) for supporting a photovoltaic cell 921) inside a building façade (wall of a building) envelope at predetermined distance from the Fresnel lens such that solar radiation is focused on the photovoltaic cell (see figure 5 and col. 3).

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 3,4-6,8-12,14,15 and 49,50-53,55,56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barone (US 6,700,055) in view of Charlton (US 4,326,012).

Regarding claims 3 and 49, Barone discloses a kit for forming a solar module, comprising: a Fresnel lens (1) comprising a substantially polygonal (rectangular shaped lens) focusing portion adapted to focus solar radiation to a polygonal area (3); and a first means (H; see figure 3 and col. 2,lines 40-50) for supporting a solar cell (3) at a predetermined distance from the Fresnel lens such that the solar radiation is focused onto the photovoltaic cell (see figures 1 and 2; col. 2,lines 40-55). However, Barone fails to specifically disclose using photovoltaic cell. Although, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a photovoltaic cell since they are well known in the for use in solar cells as efficient natural energy concentrators. However Barone fails to specifically disclose an embodiment of the solar concentrator in inside a building façade.

In the same field of endeavor, Charlton teaches a Fresnel lens assembly for incorporation in a building façade (external walls of building or house) to change thermal energy to electrical power using a photovoltaic cell (see col. 2, lines 20-27 and col. 3,

lines 34-65). Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to include this feature since it is known in the art and provides proficient source for heating or lighting buildings.

Regarding claims 4, Barone discloses an housing where the back support (H) has a first cross sectional (top) area and second cross sectional (bottom) area, but Barone fails to specifically disclose the second area is smaller than the first cross section area.

However, Charlton teaches an integrated support structure wherein the first means comprises a back support structure which has a first cross sectional area (spreads larger at the top near lens-side walls 16) at a first portion adapted to be connected to the Fresnel lens (19) and a second cross sectional area smaller than the first cross sectional area at a second portion adapted to support the photovoltaic cell (12; see figure 5). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the support structure of Barone, as taught by Charlton, since it is a well known support structure and provides an efficient, durable solar concentrator.

Regarding claims 5-6, Barone and Charlton discloses claim 4. However, Barone fails to specifically disclose wherein the back support structure comprises a substantially pyramidal or a substantially conical support structure comprising a translucent, a diffusing or a Fresnel diverging material. Charlton teaches a reflective material for directing light into the solar cell where the reflective material is shaped to block the focused radiation from being visible from the back side of the back support (not visible via material 13-see figure 5 for example). However, Charlton fails to specifically

disclose the material is diffusively reflective. It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the surface diffusively reflective, since it is known in the prior art and would produce an increase the amount scattered in the conical structure and detected by the photovoltaic cell.

Regarding claim 8, Barone and Charlton discloses the claimed invention except they fail to specifically disclose the kit of claim 4, wherein the Fresnel lens has an area of 0.2 meters square or less, the second area of the support structure comprises an area of 2 cm square or less, and a length of the support structure from the first area to the second area is 30 cm or less. However, the operation of the device is not otherwise changed and such modification would have involved a mere change in size of the component. This change in size is generally recognized as being within the level of ordinary skill in the art. *In re Rose*, 105 USPQ 237(CCPA 1955).

Regarding claims 9,10,50,53,55 and 56, Barone discloses a solar module, comprising: a Fresnel lens (1) comprising a substantially polygonal focusing portion adapted to focus solar radiation to a polygonal area; and a back support structure (H) adapted to support a solar cell (3) at a predetermined distance from the Fresnel lens such that solar radiation is focused onto the solar cell; wherein: the back support structure has first portion (top region) connected to the Fresnel lens and a second portion adapted to support the solar cell (3; see figures 1 and 3 and col. 2); and the first portion (top) of the back support structure has a first cross sectional area and a second portion (bottom) of the back support structure has a second cross sectional area. However, Barone fails to specifically disclose the solar cell

is photovoltaic cell, claimed dimensions of the Fresnel lens and support structure, located within a building façade, and the first cross section area is larger than the second cross section area.

In the same field of endeavor, Charlton teaches an integrated support structure wherein the first means comprises a back support structure which has a first cross sectional area (spreads larger at the top near lens-side walls 16) at a first portion adapted to be connected to the Fresnel lens (19) and a second cross sectional area smaller than the first cross sectional area at a second portion adapted to support the photovoltaic cell (12; see figure 5) located within a building façade envelope (external building walls). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the support structure of Barone, as taught by Charlton, since it is a well known support structure and provides an efficient, durable solar concentrator.

Lastly, Barone and Charlton fail to disclose the claimed support dimensions. However, the operation of the device is not otherwise changed and such modification would have involved a mere change in size of the component. The change in size is generally recognized as being within the level of ordinary skill in the art. *In re Rose*, 105 USPQ 237(CCPA 1955).

Regarding claim 11-12, Barone and Charlton discloses claim 10. However, Barone fails to specifically disclose wherein the back support structure comprises a substantially pyramidal or a substantially conical support structure comprising a translucent, a diffusing or a Fresnel diverging material. Charlton teaches a reflective material for

directing light into the solar cell where the reflective material is conically shaped to block the focused radiation from being visible from the back side of the back support (not visible via material 13-see figure 5 for example). However, Charlton fails to specifically disclose the material is diffusively reflective. It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the surface diffusively reflective, since it known in the prior art and would produce an increase the amount scattered in the conical structure and detected by the photovoltaic cell.

Regarding claim 14, Barone and Charlton further teaches the module of claim 10, where in Barone disclose the solar cell comprises a polygonal cell (3) which is mounted at a distance from the Fresnel lens (1) so that a size of an area of solar radiation focused by the Fresnel lens substantially matches a size of the photovoltaic cell radiation receiving area (see figure 3 of Barone).

Regarding claim 15, Barone and Charlton disclose the claimed invention of claim 10. Barone disclose a large single top Fresnel lens layer (covering opening and secondary Fresnel lens array). Charlton also discloses single Fresnel lens element-see figure 5. However they fail to specifically disclose the module of claim 10, wherein the second area of the support structure comprises an area of 0.5 to 1.5 cm square or less, and a length of the support structure from the first area to the second area is 10 to 10 cm or less and the photovoltaic cell radiation receiving are is 1.5 cm square or less. However, the operation of the device is not otherwise changed and such modification would have involved a mere change in size of the component. The change in size is generally

recognized as being within the level of ordinary skill in the art. *In re Rose*, 105 USPQ 237(CCPA 1955).

Regarding claims 51-52, Barone and Charlton fail to specifically disclose the percent of solar energy captured and transformed into electricity. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include this feature in solar concentrator, since it is known in the art to convert heat using a solar cell that converts at least 30 percent of the solar energy (official notice taken to this fact) and the higher the conversion rate the lower the cost of energy use in the building system.

6. Claims 7,13,16-20,54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barone (US 6,700,055) in view of Charlton (US 4,326,012), further in view of Kaminar et al (US 6,020,554).

Regarding claims 7,13 and 54, Barone fails to specifically disclose wherein the back support structure comprises a substantially pyramidal or a substantially conical support structure comprising a translucent, a diffusing or a Fresnel diverging material.

Charlton further discloses a substantially conical structure comprising a reflective material. However, Charlton fails to specifically disclose the material is diffusively reflective. It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the surface diffusively reflective, since it is known in the prior art and would produce an increase in the amount scattered in the conical structure and detected by the photovoltaic cell. Thus, it would have been further obvious to one of

ordinary skill in the art at the time the invention was made to modify the support structure of Barone, as taught by Charlton, to provide an collector that is efficient and durable in building structures.

Barone further teaches the support can be a scaffling structure. A scaffling structure would be an equivalent to wires or rods support structure. Furthermore, as taught by Kaminar, a snap fit structure, helps when assembling the housing. Thus, it would have still been obvious to one of ordinary skill in the art at the time the invention was made to provide a snap fit configuration, since the collector support would be easily assembled.

Regarding claim 16, Barone and Charlton disclose the module of claim 10. Barone further comprises: a focusing lens array (2;see col. 4,lines 20-42; functional equivalent of single lens covering the area) located between the Fresnel lens (1) and the solar cell (3); However Barone fails to specifically disclose the solar cell is a photovoltaic cell and a heat sink connected to the second portion of the back support structure, such that the photovoltaic cell is mounted in contact with the heat sink.

Kaminar discloses a Fresnel lens (11) and photovoltaic cell with a heat sink (15) connected to the second portion of the back support (see col. 3, lines 45-65), such that the photovoltaic cell is mounted in contact with the heat sink. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the support structure of Barone and Charlton, as taught by Kaminar, to provide a collector that receives a good concentration of solar energy and an collector that is easily assembled without specialized tools.

Regarding claim 17, Barone, Charlton and Kaminar disclose the module of claim 16, Kaminar further disclose wherein: the heat sink is selected from a group consisting of radioactive type heat sinks (see col. 3), cooling fluid type heat sinks, passive cooling type heat sinks and heat- pipe type heat sinks. However, Barone, Charlton and Kaminar fail to specifically disclose the photovoltaic cell (a semiconductor is selected from a group consisting of III-V semiconductor solar cells and vertical multi-junction (VMJ) solar cells. Although, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include a cell that multi-junction or semiconductor group II-V, since they are well known solar cells in the art (the Examine takes official notice to this fact) and multi-junction cells, for example, can be highly efficient in converting sunlight into direct electricity.

Regarding claims 18-19, Barone, Charlton and Kaminar disclose the module of claim 16, wherein Kaminar further discloses the Fresnel lens is interlocked or snap fitted to the first portion (top) of the back support structure; and the heat sink (see col. 3) is interlocked or snap fitted to the second portion (bottom portion of 18; 15,16) of the back support structure where photovoltaic cell (28) is attached to the heat sink (15). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the support structure of Barone and Charlton, as taught by Kaminar, to provide a collector that receives a good concentration of solar energy and an collector that is easily assembled without specialized tools.

Regarding claim 20, Barone and Charlton disclose the module of claim 10, Barone and Charlton fail to specifically disclose further comprising at least one air gap between the Fresnel lens and the back support structure.

Kaminar illustrates in figure 5 how the lens and back support structure fit together. As illustrated there exist an air gap in the cavity 56, such that in the connection air gaps exist between the lens and hairpin terminal 53. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Barone and Charlton, as taught by Kaminar, to provide a collector that receives a good concentration of solar energy and an collector that is easily assembled without specialized tools.

### ***Conclusion***

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Gorthala (US 6,299,317);

Whitaker (US 4,373,308); and

Kousa (US 5,851,309)

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alicia M. Harrington whose telephone number is 571 272 2330. The examiner can normally be reached on Monday - Thursday 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ricky Mack can be reached on 571 272 2333. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



AMH

Alicia M Harrington  
Primary Examiner  
Art Unit 2873